Ernst Cassirer's philosophy of biology

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Abstract. The first part of this essay outlines Cassirer's philosophy of biology in the context of philosophy of science in the 20th century, giving an overview of Cassirer's different writings on the philosophy of biology. The second part outlines his treatment of what he took to be the chief philosophical problem in the philosophy of biology: the conflict between mechanism and vitalism. Cassirer interpreted this conflict as a methodological debate, not a metaphysical problem. In Cassirer's eyes, each point of view is justified within specifics limits. The third part explicates Cassirer's critique of Darwinism. Although Cassirer was critical of particular conceptions of Darwinian evolution, he did not reject evolution and, in fact, asserted that the concept of emergence was also of far-reaching importance in other fields besides biology. Part four offers concluding remarks about the importance of the philosophy of biology for Cassirer's general philosophical orientation and for his conception of the tasks of philosophical theory.

1. Background

Ernst Cassirer's *Philosophy of Symbolic Forms* is one of the largest twentieth-century works of philosophy — three volumes and over a thousand pages — but despite its size it was unfinished. Cassirer intended to publish a further, concluding volume. He actually completed part of the book: a first chapter dealing with the problem of life and a second, more sizeable, one entitled "The Problem of the Symbol as the Basic Problem of Philosophical Anthropology". In these texts, which he dated "April 1928", Cassirer gives great prominence to Jakob von Uexküll's theoretical biology. Two years before — in 1926 — Uexküll

became the director of the Institute for Umweltforschung in Hamburg, and Cassirer became a frequent visitor to the institute and Uexküll's friend. Cassirer's 1928 text was published in 1995, in the first volume of the German Nachlass edition (ECN 1: 1–109), and soon thereafter in an English translation (Cassirer 1996: 3–111). Previously, Cassirer's debt to Uexküll was primarily known through his 1944 book *An Essay on Man*. The other source was Cassirer's treatment of biology in the fourth volume of his *The Problem of Knowledge*. That work was written in Sweden in 1940 but first appeared in an English translation in 1957. The text from 1928 was Cassirer's earliest treatment of Uexküll, but it is by no means the only example of a previously unpublished application of Uexküll's thought. The second volume of the Nachlass edition, a book Cassirer finished in 1937 called *Ziele und Wege der Wirklichkeitserkenntnis* (ECN 2), includes frequent references to Uexküll. More is still to appear. The following unpublished texts deal importantly with Uexküll: a lecture course (*Probleme der Kulturphilosophie*) from the Winter semester of 1939 in Göteborg, a manuscript entitled *Zur 'Objektivität der Ausdrucksfunktion'*, a year long lecture course in Göteborg 1939–40 on *philosophische Anthropologie*, and 1941 book manuscript in English entitled "Philosophical Anthropology" (not to be confused with the more popular *An Essay on Man*). Uexküll plays an important role in all these texts, which will be published in volumes 5 and 6 of the Cassirer Nachlass edition.

A briefer text that will also appear in the Nachlass edition (ECN 17) is historically significant. In March 1929 Cassirer gave a lecture at Davos entitled "The Basic Problems of Philosophical Anthropology".[1] In this lecture Cassirer linked concepts from Uexküll's thought and similar notions in Heidegger's *Being and Time*. Heidegger attended this lecture of Cassirer's in Davos. That October, Heidegger explicitly took up Uexküll's conceptions in his lecture course at Freiburg (Heidegger 1983), focussing upon the distinction between the 'worldlessness' of things, the 'world poverty' of animals, and the fact

[1] After the title, Cassirer wrote in round brackets "(from the standpoint of Martin Heidegger's existential analysis)". This manuscript, "Grundprobleme der philosophischen Anthropologie (unter dem Gesichtspunkt der Existenzanalyse Martin Heideggers) ", will be included in Ernst Cassirer, *Nachgelassene Manuskripte und Texte* (henceforth cited as: ECN), vol. 17.

that humans are able to fashion worlds.[2] As far as I have been able to determine, it was Cassirer who introduced Heidegger to Uexküll.

By the time all of these texts relating to Uexküll are available it will be clear that Cassirer's late work was deeply indebted to Jakob von Uexküll and it will be obvious that Cassirer was himself a pioneer in biosemiotics.[3] In his text on the "Objectivity of the expresssive function" of symbolism and his philosophical anthropology Cassirer treats semiotic processes in biological and not just in cultural terms.

Here, I am not going to enter into these new, and as yet unpublished writings, rather my focus will be more general: Cassirer's placement of biology in philosophy.

Cassirer is best-known as an interpreter of modern physics, but he also developed a theoretical interpretation of biology. Biology was of great significance for his philosophy of symbolic forms[4] and especially for its explication as a philosophical anthropology. Cassirer's teachers at Marburg — Hermann Cohen and Paul Natorp — interpreted Kantianism as a philosophy of natural science and especially of mathematical physics.[5] Cohen and Natorp were not alone in attributing to physics favored status as a science, indeed, this was typical among philosophers throughout most of the twentieth century. In the 1920s and 30s, the philosophers in the "Vienna Circle of Logical Positivism" (centered around Moritz Schlick, Otto Neurath, and Rudolf Carnap) and the "Berlin Group" (led by Hans Reichenbach), all treated physics as the prototype of genuine scientific knowledge. This elevation of physics went together with their conception of the "unity of science" expressed in the doctrine of "physicalism". Physicalism is the doctrine that all descriptions are "subjective" unless they are expressed in physicalistic language. Hence, in order to be scientific, psychological, sociological, and biological terminology all needed ultimately to be rephased in the language of physics. The

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[2] See Heidegger, 1983: 263: "1. der Stein (das Materielle) ist weltlos; 2. das Tier ist weltarm; 3. der Mensch ist weltbildend".

[3] Biosemiotics has been defined as "the study of signs, of communication, and of information in living organisms" (Oxford Dictionary of Biochemistry and Molecular Biology 1997: 72; cf. Hoffmeyer 1998.

[4] References to the philosophy — and not just the book of that name — are given in lower case spelling.

[5] Cohen (Cohen 1918: 94) contended that Kant's transcendental method arose from his reflection on Newton's Philosophiae naturalis principia mathematica.

"unity of science" in the philosophy of science meant: unity based upon the supremacy of physics.

Cassirer knew the Vienna circle philosophers and Reichenbach personally, and he followed their work, often with approval — except for their physicalism. For Cassirer, the unity of science could neither be interpreted to mean the supremacy of one science above all the others nor the natural sciences over the cultural sciences (by which he meant both the social sciences and the humanities) or vice versa. The unity of the sciences is functional, not substantial as phyicalism proposed.[6] As Cassirer explained in the preface and introduction to the first volume of his *Philosophy of Symbolic Forms* (Cassirer 1953), different ways of having a world can be understood as distinct symbolic forms, which have a functional, rather than a substantial unity. Cassirer's criticisms of physicalistic philosophy of science enabled him to give biology far greater importance than it was granted in the Vienna or Berlin schools. Cassirer's well-known books on the theory of relativity (Cassirer 1953a) and on the problem of causality in quantum physics (Cassirer 1956) are his most extended writings on the philosophy of science. This is not surprising considering the philosophical problems raised in these fields in the early part of the twentieth century for traditional conceptions of space, time, and causality, or for such particular notions as that of a material point. Nonetheless, it would be a mistake to assume that Cassirer's lesser-known writings on the philosophy of biology only were of marginal importance for him.

Cassirer began his academic career in 1892 as a student of German literature, but he switched to philosophy after four years of study due to disappointment with the anti-theoretical and biographical approaches prevalent then in German studies. Cassirer's earliest theoretical orientation stemmed from this first stage of his academic career. As a student of German literature, long before he read Kant or took up philosophy, Cassirer was already an avid admirer of Goethe. His admiration, which bordered on fascination, continued his life long; indeed, he once remarked that he had read in Goethe's works almost

[6] Many of Cassirer's writings on these subjects were never published. Some with be appearing soon in ECN, vol. 8. For a discussion of his unpublished writings about the Vienna Circle and the prevalent forms of philosophy of science, see Krois 2000.

daily for 50 years — from age 16 on.[7] Goethe, of course, was not only a dramatist and poet, but a scientific thinker whose chief concern was the study of life.

When Cassirer switched his field of study from German to philosophy in the Winter semester of 1896/97 his outlook was already deeply influenced by his reception of Goethe's work. Cassirer's interpretation of biology needs to understood against the background of his work on Goethe, and this is also true of the growing importance he attributed to biological theory in his later years when he developed his philosophical anthropology.

While philosophers have always raised questions about the nature of humanity, "philosophical anthropology" was a distinct development in German philosophy in the 1920s, arising from dissatisfaction with purely empirical, quantitative approaches to the human sciences. Philosophical Anthropology sought to avoid treating human beings in physicalistic terms, yet some writers, such as Helmut Plessner, preserved an almost positivistic, purely descriptive approach, while Max Scheler, assumed a kind of religious perspective. Cassirer's best-known work on the subject, *An Essay on Man* (Cassirer 1944), focused upon human creativity, which he traced to the use of symbolism, hence his definition of human beings as "animal symbolicum". Kant had introduced the study of anthropology into philosophy, but for Kant the concept of reason (*Vernunft*) defined mankind, and reason was universal. Symbolism was not reason. Mythologies and many other forms of communal symbolism have only local validity. Yet, Cassirer contended, it was symbolism which also made reason possible. That much of Kant remained in Cassirer's philosophical anthropology.

Kant, of course, also wrote about the problem of teleological judgement in biology in his *Critique of Judgement*, but this side of Kant's work was not what interested Cassirer's philosophical mentors. Paul Natorp's well-known book on Plato (Natorp 1903) showed that modern mathematical physics could be interpreted as a new form of

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[7] The depth of Goethe's influence on Cassirer has been greatly underestimated. His fascination with Goethe is most evident in his Swedish lectures on Goethe, which are now in press as vol. 11 of ECN. A check of the membership roster of the Goethe Gesellschaft (published annually in the "Jahresberichten der Goethe-Gesellschaft" in the *Goethe-Jahrbuch*) lists Cassirer from 1895 (vol. 16: 22) until he left Germany in 1933.

Platonism. Cassirer too saw mathematics as the bond between Galileo and Plato, but he did not relegate the theory of life to a minor position in his interpretation of science. Unlike Cohen — who is said to have referred to Aristotle as "the apothecary" — Cassirer seems to have shown increasing interest in Aristotelianism as time went by, because of the latter's work on biology. An indication of Cassirer's perspective can be found in a series of lectures on Greek philosophy which he gave at Yale in 1941 and 1942. There for the first time he gave a systematic interpretation of Aristotle's philosophy (120 pages).[8] Rather than focusing upon Aristotles' metaphysics or logic, Cassirer saw the "centre of gravity" in Aristotle's philosophy in his theory of organic growth. Cassirer wrote at the beginning of the lectures: "Within the limits of these lectures I cannot give you a description of the Aristotelian system and of all its ramifications. I only wish to find, as it were, the centre of gravity of this system. To my mind this centre of gravity is to be sought in the biology of Aristotle, in his theory of organic life". In the next paragraph Cassirer stated: "Mathematics is the clue that serves us as guide in our study of Platonic philosophy; organic life and the laws of organic development are the clue that we have to follow in our study of Aristotle".[9]

Cassirer's most extensive publication on biology was the 100-page section on the history of biological theory in volume 4 of his *The Problem of Knowledge*.[10] Goethe is clearly the central figure in this history. Cassirer's primary concern was to trace the conflict between supporters of Mechanism and Vitalism and to show the importance of this debate in transforming the conception of scientific knowledge. He covered much the same ground in a large unpublished study written about the same time (between 1936 and 1940) on the *Objectivität der Ausdrucksfunktion* (objectivity of the expressive function) and in the recently published (ECN 1: 3–109; Cassirer 1996: 3–111) first statement of his philosophical anthropology (from 1928). Cassirer also

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[8] This text will appear in ECN 13.

[9] Cassirer, "Aristotle", second paragraph (Yale Beinecke Mss 98, box 36, folder 690).

[10] Cassirer wrote the manuscript of this book between July 9 and November 26, 1940. See Charles W. Hendel: Preface (Cassirer 1950: ix). The original German text was not published until 1957. The new edition (Cassirer 2000) of this volume in Cassirer's works (ECW) includes a complete bibliography of the large literature on biology cited in the book.

discussed biology in various published essays as well.[11] To understand Cassirer's position it is best to begin with the theoretical problems to which he reacted.

2. The vitalist controversy

Cassirer conceived the conflict between mechanists and vitalists as a methodological debate, not a metaphysical problem. In Cassirer's eyes, each point of view is justified within specifics limits. Cassirer was ready to side with a strict mechanist like Jacques Loeb when he explained the growth of plants towards the light by means of a system of "tropisms" or involuntary changes due to physical processes, just as he was critical of Fechner's view that this turning of plants towards the light was a sign of a "*höhere Sehnsucht*" ("higher longing", ECN 2, 144). In the same way, Cassirer also rejected Driesch's return to the Aristotelian notion of "entelechy" and, indeed, all speculative notions of life, which, as Cassirer said, went "beyond anything that *science* could establish or prove" (Cassirer 1950: 196). Yet Cassirer agreed with the vitalists' contention that life is a phenomenon *sui generis* that could not be subsumed under mechanism. Cassirer developed his own version of organicism, i.e., he believed that biology deals with wholes.

A particularly telling comment of Cassirer's about biology can be found in an essay where one would hardly expect it: his posthumously published lecture "Structuralism in Modern Linguistics". Cassirer argued there that biology and modern linguistics both employ comparable methodological conceptions, for neither can be modeled upon mechanistic conceptions. Rather, the principles of knowledge in biology are akin to those of linguistics in that both are "structural". That is, each deals with systems in which the relationships between the elements produce a complex whole, and both study structural changes morphologically, rather than causally. Cassirer found his view best illustrated in L. v. Bertalanffy's *Theoretische Biologie*, about which he said: "It puts in place of the idea of purpose the concept of organization and characterizes life by ascribing to it the

[11] Cassirer also dealt with these issues in unpublished manuscripts such as the text of his Yale Seminar on Symbolism and the Philosophy of Language from 1941–1942, the fourth chapter was which is devoted to "The biological aspect". This material is closely related to Cassirer 1944.

property of a system" (Cassirer 1950: 216). In addition to Bertalanffy, Cassirer cites Haldane's conception of holism and Uexküll's theoretical biology as illustrations of this conception of biology, which he traces back to Goethe.

While Goethe is the chief figure in Cassirer's historical treatment and conception of biology, he does not regard his work without considerable reservations. Cassirer did not agree with Goethe's rejection of mathematics nor his denigration of interventional experiments, or his preference of imaginative vision over historical, phylogenetic study. Goethe relied upon observation alone, yet his observations led him to discoveries of fundamental importance, in particular they convinced him of the untenability of the supposed immutability of botanical classifications. To Goethe, Linné's strict divisions according to the number of stamen and pistils in a plant and the assumption of fixity in the botanical world misrepresented nature. Cassirer notes that in the 19th century, Goethe was given the highest praise possible: he was called a "Darwinian before Darwin" (Cassirer 1950: 137). However, Cassirer is anxious to point out that Goethe was a morphologist, not an evolutionist.

Goethe's notion of 'morphology' — a word he invented — derived from his empirical observation of the fact that the same plants grew differently in different environments. Goethe no longer regarded botanical form as fixed; he discovered the variability and changing nature of species. But he did not, like Darwin, concern himself with their genealogy. As Cassirer put it, "Goethe's concept of 'genesis' is dynamic, not historical" (Cassirer 1950: 149). Instead of facing the empirical question of the descent of species, Goethe gave an ideal outline of the process of transformation. To Cassirer's mind this was a virtue, not a fault, because Goethe did not confound the concept of structure with that of mechanical causation. Goethe's Morphology offered a way to conceive of changing biological forms without reference to mechanistic views or returning to teleological conceptions of nature.

Cassirer cites approvingly Bertallanfy's criticism that Darwin made improper use of the notions of "survival" and "adaptation" by treating them as purposive conceptions. Goethe's conception of the organism regarded species as changing, temporal identities without resorting to *any* kind of teleology. As Cassirer put it, Goethe no longer thought in terms of "spatial forms" (*Raumgestalten*) but rather in

"temporal forms" (*Zeitgestalten*) (Cassirer 1950: 147). On Cassirer's view, the notion of a biological species was a whole with temporal limits. The unity of a species was the history of its development. Cassirer argued that while the idea of purpose had no place in modern science, this could not be said of the notion of a "whole". (He argued that the concept of an organized whole is needed in other sciences as well, including field physics and Gestalt psychology (see Cassirer 1945; cf. Cassirer 1950: 212). Cassirer wrote in the *Problem of Knowledge*: "In contrast to the idea of purpose, the concept of organization characterizes life by ascribing to it the property of a system" (Cassirer 1950: 216). This view undercuts the battle between mechanists and vitalists, for it offers no barrier to physicochemical explanations yet maintains that not all biological phenomena can be so explained, namely, the structures of living things as wholes. Anatomy, or rather comparative anatomy, therefore assumed fundamental importance for zoology on Cassirer's view, just as it was the empirical basis for Darwinianism as well.

According to Cassirer, biology became an autonomous field of study with the publication in 1543 of Vesalius' *De Humani Corporis Fabrica* (On the Fabric of the Human Body) (see Cassirer 1943). In that work Vesalius created empirical descriptive anatomy, breaking with the ancient authority of Galen and explanatory theories taken from ancient physics (such as the four elements) or astrological "correspondences". This emphasis on the importance of anatonomy for biology also explains why Cassirer took such an intense interest in the theoretical biology of Jakob von Uexküll, for, as Cassirer once wrote: "Uexküll was above all an anatomist" (Cassirer 1950: 199; cf. ECN 1 40–43 and Cassirer 1996: 43–45).

Jakob von Uexküll (1864–1944) was Cassirer's colleague and friend in Hamburg in the 1920s. Cassirer was drawn to Uexküll because the latter's view of anatomy resurrected Goethe's program of morphology (Cassirer 1950: 200). Goethe's approach to biology, Cassirer thought, was the source of Uexküll's definition of the study of life. Cassirer was so taken with Uexküll's definition of biololgy he quoted it twice in full in his study of the history of biology in *The Problem of Knowledge* (Cassirer 1950: 129, 199). Uexküll said: "The science of living beings is a purely natural science and has but one goal: investigation of the structure of organisms, their origin, and their functioning" (Cassirer 1950: 199; cf. Uexküll 1930: 9). In an un-

published text Cassirer stated explicitly that Uexküll was the biologist who avoided both extremes in the controversy between Mechanists and Vitalists: "The real *middle* way in biology is taken here by Uexküll, who is a methodical Vitalist, without being a metaphysical Vitalist".[12]

Uexküll's own contribution to biology derived, however, from his expansion of the viewpoint of descriptive anatomy to include a conception of an organism's environment (*Umwelt*). These aspects come together in his concept of the structure of an organism, which he called its "Bauplan" or structural form.[13]

Cassirer emphasized repeatedly the importance of Uexküll's view of the "Bauplan".[14] The following passage is from his 1928 text on "Das Symbolproblem als Grundproblem der philosophischen Anthropologie", but a similar assessment is found sixteen years later in *An Essay on Man* (Cassirer 1944: 23ff).

Cassirer wrote in 1928:[15]

> This organization [Bauplan] creates the environment of living organisms so that this is in no case a constant but rather different for every creature since it varies with their organizations [Bauplan]. Just as environmental factors are

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[12] "Die richtige Mitte in der Biologie hält hier Uexküll, der methodischer Vitalist ist, ohne metaphy.[ischer] Vitalist zu sein" (Cassirer, Objektivität der Ausdrucksfunktion, section VII., in Beinecke Mss. 98, Box 52, Folder 1043). This text will appear in ECN 5.

[13] See Uexküll 1930: 73–75: "Die Baupläne". Cf. Uexküll 1921: 5: "Über der Innenwelt und der Umwelt steht der Bauplan, alles beherrschend. Die Erforschung des Bauplanes kann ... allein die gesunde und gesicherte Grundlage der Biologie abgeben". (Over and above the inner world and the surrounding world stands the bauplan, governing everything. An examination of the bauplan provides the only healthy and secure basis for biology.)

[14] See e.g. Cassirer 2000a: 23–27, where "Bauplan" is translated as "blueprint".

[15] "Der Bauplan schafft selbsttätig die Umwelt eines Lebewesens, sodaß diese keineswegs als konstant, sondern als für jedes Wesen verschieden, als mit dem Bauplan variabel anzusetzen ist. Und ebenso objektiv[,] wie es die Faktoren der Umwelt sind, müssen die von ihnen hervorgerufenen Wirkungen im Nervensystem aufgefasst werden. Auch sie sind nirgends anders als von der körperlichen Struktur her bestimmbar, und sie sind von vornherein durch diese gesichtet und geregelt. Die Gesamtheit dieser Wirkungen nun ist dasjenige, was wir als die "Innenwelt" eines Lebewesens bezeichnen, sodaß — wie Uexküll betont — auch die Feststellung dieser Innenwelt "die unverfälschte Frucht objektiver Forschung" bildet, die "nicht durch psychologische Spekulationen getrübt werden" soll" (ECN 1: 41).

> objective, so too we must take as objective the effects called forth by it [the Bauplan] in the nervous system. These effects too can only be determined by reference to the body's structure, and from the outset they must be seen as regulated through it. Now the totality of these effects is what we designate as the 'inner world' of a living creature, so that — as Uexküll emphasizes — even establishing the existence of this inner world is 'the unspoiled fruit of objective research', which 'should not be clouded by psychological speculation'. (Cassirer 1996: 42f)

The Bauplan embraces not only the brain and nervous system, as well as the skeleton but the total anatomy of the organism. The primacy of the Bauplan brought with it Uexküll's characteristic approach to the distinct "worlds" of animals. According to the anatomical structure (*Bauplan*) of the animal, with its particular receptor and effecter systems (*Merknetze* and *Wirknetze*), the animal lives and moves in specific functional circles (*Funktionskreise*): circles of nutrition, defense, and reproduction. As Uexküll colorfully puts it: "In the world of a fly, we find only fly things, in the world of a sea urchin only sea urchin things" (Cassirer 1944: 23). Cassirer concludes: "The experiences — and therefore the realities — of two different organisms are incommensurable with one another" (Cassirer 1944: 23).

This kind of pluralism was for Cassirer a modern version of Goethe's conception of the uniqueness of each biological form (Cassirer 1950: 204). Each has its own center within itself, which cannot be measured by any kind of external purposiveness.

3. Cassirer's critique of Darwinism

Cassirer did not reject evolution, but he criticized Darwin's interpretation of it. In his text on "Darwinism as a Dogma and as a Principle of Knowledge" (Cassirer 1950: 160–175) he offered a balanced critique of both dogmatic adherence and dogmatic opposition to Darwin's ideas. Cassirer's own criticism was quite specific. Darwinism has been variously extrapolated to social theory. Darwin cannot be blamed for the interpretations which have been placed upon his notion of "the fittest," but much of Cassirer's general disinclination towards the theory of evolution relates to the socio-political interpretation of Darwinism, although it does not derive from this alone. When Cassirer wrote his study of biology in Swedish exile in

1940, the notion of a master race was having its political heyday, and it is noteworthy that Cassirer took pains to show a further point of agreement between Uexküll's biology and another basic aspect of Goethean morphology: namely, the elimination from biology of the ranking of species.

For Goethe, the biosphere is not ordered such that the various kinds of animals exist for each other, or form a series which finds its end — in either the sense of a terminus or a purpose — in any species, including mankind (Cassirer 1950: 203). Cassirer emphasized that for Goethe "it would be impossible to select any single race, human or otherwise, from the totality of life and set it up as the goal, the measure, the canon" (Cassirer 1950: 204). Cassirer cites the following passage from Goethe's comparative anatomy to illustrate this: "An individual cannot serve as a standard for the whole, and so we must not seek the model for all in any one. Classes, orders, species, and individuals are related as cases are to a law; they are included under it, but do not constitute it" (Cassirer 1950: 144). The "law" in question is the principle of morphology.

Goethean morphology abandons both "the invariability of the species" and the view that any species of life is superior to any another. This conception is fundamentally pluralistic, and on this point in particular, Cassirer says: "Uexküll's biology conformed in every particular with this view of Goethe" (Cassirer 1950: 205). The social and political undercurrent in this line of argument is unmistakable, but it would be wrong to conclude that Cassirer was attracted to such a theoretical position for political reasons. Rather, Cassirer's entire approach to science and culture was conceived from the outset in reference to his criticisms of traditional logic, with its hierarchy of classes based upon the concept of substantial forms or essences. Beginning with his first systematic work, *Substance and Function* in 1910, Cassirer denied any scientific value to traditional logic. The subsumption of things under higher classes is typical of language, but the resulting classifications are just that: linguistic classifications. This capacity to make binary divisions led early biology into the realm of mere names which Cassirer says even became "a veritable mania for classification" in Linnaeus (Cassirer 1950: 127). In *Substance and Function* he showed how in numerous sciences the logic of relations and functional thinking had replaced traditional logic. Later, in *The Philosophy of Symbolic Forms*, he argued for contextualisation against

panlogism and developed a pluralistic conception in which different symbolic forms were regarded as autonomous ways of having a world. It is no wonder that he found Uexküll's notion of irreducibly different surrounding worlds (Umwelten) congenial.

Cassirer approved of Goethe's abandonment of the invariability of species, but he still had to address the problem of how to explain their origin. Cassirer's most explicit statements on this question are found in his study "The Problem of Form and the Problem of Causality" in his late (1942) book *Zur Logik der Kulturwissenschaften* (*The Logic of the Cultural Sciences*). This study explicates a fundamental conception in Cassirer's general philosophy of science: the indispensability of discontinuity for development. Cassirer distinguishes the concepts of form and causality radically, and suggests that the emergence of new structures demands abandoning the ancient notion of *natura non facit saltus*, for, he contends, Nature does make jumps. He quotes approvingly from Hugo de Vries' characterization of mutations (Cassirer 2000a: 102), where he claims that the origin of a species "constitutes a break which sharply and completely distinguishes the new form as a species from which it came. The new species comes into being immediately; it arises from the earlier one without detectable preparation and without transition". Cassirer says that such a "metabasis eis allo genos" is found again and again in both natural and cultural developments. This notion of going over into a new genus or category is recurrent throughout all of Cassirer's writings, not only in his philosophy of biology.

Cassirer claims that empirical research and philosophy are here on the same footing: they can exhibit the emergence of new forms but they cannot give any causal explanation of them.[16] Here he sees himself as following Goethe, whose notion of the *Urphänomen*, Cassirer explains, entails admitting that such developments are "irreducible facts" (Cassirer 2000a: 99). Yet these are processes, and processes emerge from other processes. Cassirer affirmed a concept of

[16] Cassirer claims that the shift from language as a vent for expressing feelings to language as a tool for attaining practical ends and to language as a means for asserting propositions is always a jump, never a gradual change. Cf. Box 52, folder 1041: "Aber weder der Empfindungslaut, noch der Wirk- und Werklaut (Noiré) kann die dritte Stufe der Sprache, die rein symbolische Darstellung erfassen und erklären. Hier bedarf es immer eines "Sprunges", einer "Mutation", nicht Evolution."

emergence which demanded more theoretical explication than he ever provided.[17]

4. Concluding remarks

Cassirer's interpretation of biology was not an isolated part of his philosophy, rather it can be found incorporated into and further developed within his philosophical anthropology. An illustration of this can be seen in his reception of the work of the neurologist Kurt Goldstein. Goldstein was most noted for his work on aphasia, which concentrated upon the effects of brain damage on the use of language. Goldstein did not think that neurology should focus upon the activity of the brain or neural paths independently of the rest of the organism. For example, he did not think that language abilities were localized in a fixed place in the brain but could be transferred. Rather than viewing the symptoms of aphasia as negative signs of a loss, Goldstein regarded them positively as the attempts of the organism to find a new way to preserve a function. In Goldstein's book, *The Organism*, (Goldstein 1995, first published in German in 1934) he regarded the organism and its environment in terms comparable with Uexküll. Cassirer visited Goldstein's clinic in Frankfurt to observe the behavior and speech of patients suffering from aphasia.[18] These observations provided the background for the chapter on the pathology of the symbolic function in the third volume of *The Philosophy of Symbolic Forms*, one of the most important texts for Cassirer's philosophical anthropology. Cassirer conceived of this chapter as a kind of negative proof of his theory of symbolism: "the process of the world's 'symbolization' discloses its value and meaning where it no longer operates free and unhindered, but must struggle and make its way against obstacles" (Cassirer 1957: 277). These words, echoing Goldstein's model of the organism, show that Cassirer's philosophical anthropology is closely linked to his theoretical interest in biology. Cassirer's *An Essay on Man* did not appear until 1944 but the ideas in

[17] For a recent study of Goethe dealing with the close affiliation of his conception of science and process philosophy, see Stephenson 1995.

[18] On Cassirer's contacts with Goldstein in Frankfurt, see Cassirer 1957: 210, n7 and 217, n19. Cf. esp. Cassirer 1999.

that book derived ultimately from his contacts with Goldstein and Uexküll in the 1920's.

Cassirer upheld what we might best be called a medical model of biology, for he regarded life in terms of concrete, particular, even individual forms. The organism in its environment could only be understood in terms of this particular unique whole taken as an individual case. While chemistry may supply the answers to questions linking botanical and zoological processes with the physical world, this in no way eliminates the validity of a medical "case" model for the study of life processes. Anatomy, on Cassirer's view, becomes the focal point for zoology because the interaction of the organism with its environment is an ultimate phenomenon for biology.

The individual has a similar central place in Cassirer's philosophical anthropology. Cassirer defined humanity by reference to the use of symbols, reinterpreting the traditional notion of *animal rationale* as *animal symbolicum*. He conceived his view as a supplement to Uexküll's theory of the animal's *Bauplan*. Human beings have a symbolic world that cannot be compared with animals' reactions to signs (Uexküll's *Merknetz*). Humans develop "symbolic worlds" which acquire an objective status of their own. While language can be used to give oral signals, there is a difference of kind between such behavior and the use of written, propositional language, just as there is between the use of stick as a tool and the creation of a technology, i.e., a system of instruments. With the development of such systems, individual actions and documents can have long-lasting and wide-ranging effects over generations. Cassirer contended that there can be no transition between an animal's *Merknetz* of signals and such "symbolic systems",[19] but only a metabasis eis allo genus — a jump to a new species.

But even Cassirer's philosophical follower, Susanne Langer, did not want to leave the jump from the animal to the human unbridged. In her late work (Langer 1967; 1972; 1982) she sought to understand this shift by investigating the nature of feelings. Empirical researchers have not been satisfied with this purely descriptive outlook either. The "symbolic species" (Deacon 1997) has a history, which can be reconstructed, and research on the co-evolution of symbolism and the brain may show that Cassirer's biosemiotic perspective is better as a

[19] Cassirer 1944: 24. Cassirer also refers there to symbolism as a medium (Cassirer 1944: 25) and to different symbolic forms as media.

program for research than as a "final interpretation" of the question of the "nature of man" than Cassirer seemed to think.

On the other hand, Cassirer's attempt to show the limits of causal explanation is clearly valid in the area of symbolic systems. Popper rejected the possibility that so-called "laws of history" could predict historical developments, for they would also have to predict the course of future scientific knowledge. Cassirer proposed a comparable view in his essay on the "Naturalistic and Humanistic Philosophies of Culture" (Cassirer 1961), which he first gave as a lecture in Vienna in 1937 at the *Kulturbund*. History, Cassirer argued, is dependent upon symbolic meanings, but we cannot predict the way the different symbolic forms of culture will develop. Unlike Popper, however, Cassirer did not adopt evolution, even in a reinterpreted form, as a model for the theory of knowledge, even though Cassirer recognized that symbolisms were the means to problem solving. Cassirer's view of evolution, if he would have accepted that name for it, would have been more like Peirce's, who distinguished between evolution due to some causal principle and cases requiring the assumption of absolute chance (tychism), i.e., of developments "without detectable preparation and without transition".

Cassirer granted teleological conceptions a place in social and psychological theory, but not in biology. For all his interest in anthropology, Cassirer was critical of anthropomorphism. On this point he liked to quote Goethe, who said, "Nature and Art are too great to be directed to ends".[20]

Cassirer erected a high wall between causal explanation and the concept of structure in his theoretical interpretation of biology so as to avoid teleological assumptions about natural processes. This wall was permeable in the last analysis because the notion of morphology permitted Cassirer to conceive the rise of new forms by non-mechanical explanations, relying ultimately upon the notion of chance. The

[20] See ECN 11, Goethes geistige Leistung, Erste Vorlesung. The passage reads: "Natur und Kunst sind zu groß, um auf Zwecke auszugehen". Cassirer's source is Goethe (1830: 223): "es ist ein gränzenloses Verdienst unsres alten Kant um die Welt, und ich darf auch sagen um mich, daß er, in seiner Kritik der Urtheilskraft, Kunst und Natur kräftig nebeneinander stellt und beiden das Recht zugesteht: aus großen Principien zwecklos zu handeln. So hatte mich Spinoza früher schon in dem Haß gegen die absurden Endursachen gegläubiget. Natur und Kunst sind zu groß, um auf Zwecke auszugehen, und haben's auch nicht nöthig, denn Bezüge gibt es überall und Bezüge sind das Leben."

recent dissemination of self-organization theories seems to indicate that Cassirer was perhaps on the right track. In any case, his theoretical interpretation of biology was not just of incidental importance to him, but an integral part of his own philosophy.

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Философия биологии Эрнста Кассирера

Первая часть статьи описывает философию биологии Эрнста Кассирера на фоне философии науки XX века, давая заодно обзор важнейших работ Кассирера о философии биологии. Вторая часть посвящена проблеме, которая, по мнению Кассирера, является главным философским вопросом биологии, — конфликту механицизма и витализма. Кассирер показал, что в этом конфликте мы имеем дело с методологическим спором, а не с метафизической проблемой. Обе точки зрения — как механицизм так и витализм — по мнению Кассирера в определенной мере оправданы. В третьей части статьи рассматривается критика дарвинизма Кассирером. Хотя в целом Кассирер относился критически к дарвинисткой эволюционной концепции, он не отрицал эволюцию и считал, что понятие эмергенции имеет значение и за пределами биологии. В заключении показывается значение философии биологии в философской ориентации Кассирера в целом и в его взгляде на задачи теории философии.

Bioloogia filosoofia Ernst Cassireril

Artikli esimene osa kirjeldab Ernst Cassireri bioloogiafilosoofiat 20. sajandi teadusfilosoofia taustal, andes ühtlasi ülevaate Cassireri erinevatest kirjutistest bioloogia filosoofia kohta. Artikli teises osas vaadeldakse probleemi, mis on Cassireri vaate kohaselt bioloogia peamine filosoofiline küsimus — mehhanitsismi ja vitalismi konflikti. Cassirer näitas, et selle konflikti puhul on tegu metodoloogilise vaidluse, mitte metafüüsilise probleemiga. Mõlemad seisukohad — nii mehhanitsistlik kui vitalistlik — on Cassireri meelest oma teatavais piirides õigustatud. Kolmandas osas käsitletakse Cassireri darwinismikriitikat. Olles kriitiline Darwini evolutsioonikontseptsiooni suhtes, ei eita Cassirer evolutsiooni, ning nägi emergentsuse mõistel bioloogiast kaugemale ulatuvat tähtsust. Neljandas osas tehakse kokkuvõte bioloogia filosoofia tähtsusest Cassireri filosoofililisele orientatsioonile tervikuna ja tema vaatele filosoofiateooria ülesannetest.